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INNOVATION OF INDUSTRIAL ENTERPRISES IN POLAND AS COMPARED TO OTHER EUROPEAN UNION COUNTRIES

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1. Introduction

Innovation is presented as business entities' capability and motivation to constantly search for previously unknown concepts, ideas and inventions, and to make practical use of results of scientific research and outcomes of work in the area of R&D. Innovation activities which are an important element of the operation of enterprises, allow them, at the same time, to raise the level of competitiveness in the market [1, p.23]. The aim of the study is to assess the innovation potential and innovation activity of industrial enterprises in Poland as compared to other European Union countries. This particular economic sector has been selected for the following reasons: on the one hand, industrial enterprises report the demand for cutting-edge solutions in the field of science and technology, while on the other hand, they provide their market partners with technological innovation. Therefore, as it was pointed out by M. Bukowski, A. Szpor and A. Śniegocki [2, p.119], relationships between the industry and other participants of innovation activities (i.e. science and the government) determine the competitive position of the given country's economy on the international scene. In addition, the growing importance of knowledge in the field of economic management results in an enhancement of the status of both research and development work and innovation in the operation of that economic sector [3, p.107].

2. Methods of research

The subjective scope of the analysis as presented in the study included industrial enterprises in Poland and other European Union countries. The objective scope of the research covered innovation being expressed as an organization's capability and motivation to constantly search for and make use of results of scientific research, and of modern concepts, ideas, and inventions [4, p.6]. The study considers the timeframe for research including the period of 2002–2010. The adoption thereof was substantially influenced by the nature of the programme for statistical research in the field of innovation, namely the Community Innovation Survey. Research results of consecutive rounds covered a two-year period. The measures as made available (primarily in the Eurostat database) for the years 2002–2004 are the results of the fourth round of the research (CIS 4); for the years 2004–2006 – the results of the fifth round (CIS 2006); for the years 2006–2008 – the results of the sixth round (CIS 2008); and for the years 2008–2010 – the results of the seventh round (CIS 2010). The following indices of industrial enterprises' innovation were analysed and compared: the percentage of innovative enterprises in the total number of enterprises (%); the percentage of enterprises being engaged in the in-house R&D activities in the total number of innovation-active enterprises (%); and the percentage of enterprises which co-operated in innovation in the total number of innovation-active enterprises (%). Attention is also drawn to the scope of public support for innovation activities of industrial enterprises.

3. Results and discussion

What is indicative of innovation measures being taken by industrial enterprises is their innovation activity, the basic index of which is the percentage of innovative entities in the total number of enterprises. In particular EU countries, the levels of that index varied greatly, and ranged from 16% in Romania to 70% in Germany (Fig. 1). It should be stressed that Germany is the unquestionable leader of the ranking. A significant difference was recorded between the level of innovation activity of industrial enterprises in Germany and the level being represented by countries that follow: in Belgium the index amounted to 58%, and in Ireland to 57%. According to Weresa [5, p.16], the high

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level of innovation activities in that country results from the systemic and institutional support of German enterprises. The government programme of the so-called "grand coalition" as established following the 2005 election provided for increasing the importance of policy in the field of science, innovation and technology. An outcome of such an approach was both institutional changes to the system of innovation, and cutting-edge instruments of innovation policy. An example of the above-mentioned changes was the establishment of the Ministry of Economy and Technology which participates in shaping the Germany's innovation policy. The countries in which the percentage of innovative companies was the lowest in relation to the total number of enterprises in the industry included Romania, Poland, Hungary and Latvia (with the index level ranging from 16% to 19%).

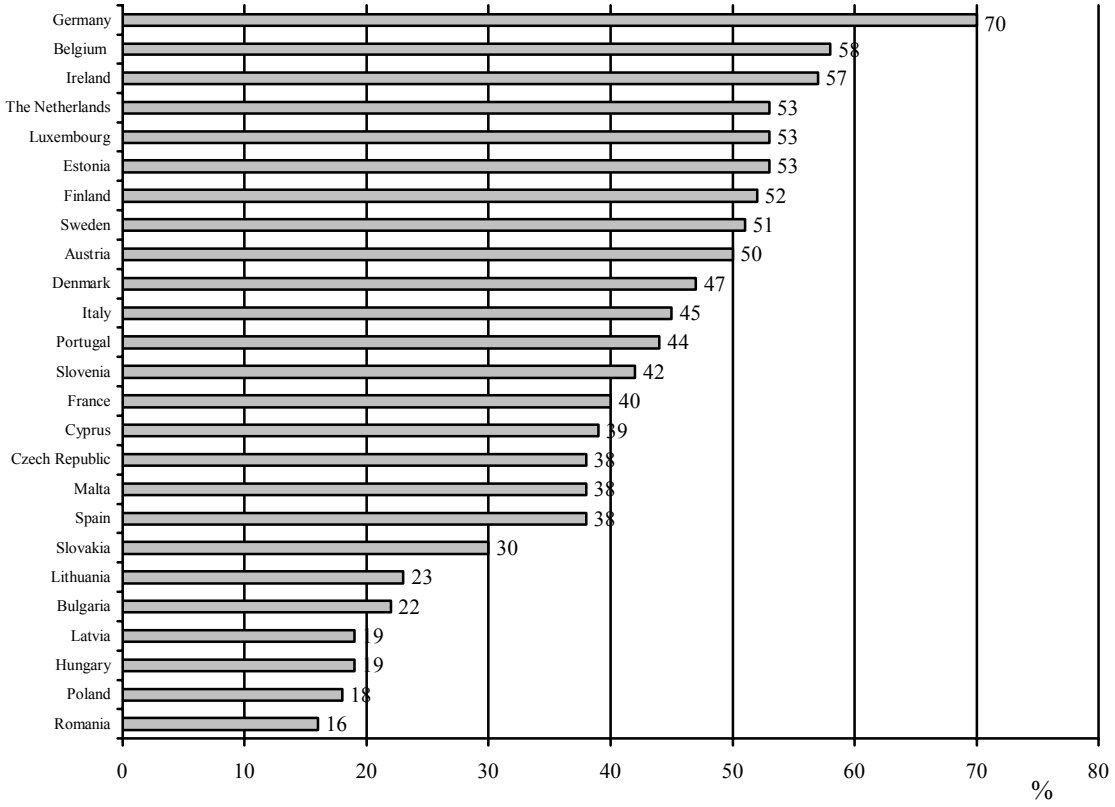

Fig. 1. Percentage of innovative enterprises in the total number of enterprises (%)
Source: own work based on: http://appsso.eurostat.ec.europa.eu/nui/setupModifyTableLayout.do.

When searching for the causes of the low level of innovation activities of industrial enterprises in Poland, attention was drawn to the percentage of enterprises being engaged in the in-house research and development (R&D) activities. This is because the essence of R&D activities is searching for both the new areas of knowledge and the possibilities for making use of the already existing ones. In the years 2002–2004, the percentage of companies being engaged in the in-house R&D activities amounted to 31%. Our country was thus ranked at 18th position among 22 European Union Member States. A comparison of the index level in our country with the maximum index level as observed in the European Union (85%) indicates that the situation is unfavourable (Tab. 1).

Tab. 1. Percentage of enterprises being engaged in the in-house R&D activities in the total number of innovation-active enterprises (%)

Specification	Years			
	2002–2004	2004–2006	2006–2008	2008–2010
Poland	31	38	33	34
Countries with values similar to those of Poland	Romania Lithuania	Spain Cyprus	Estonia Latvia	Latvia Romania

Poland's position in the EU	18	16	20	23
Min.	9 (Bulgaria)	12 (Bulgaria)	8 (Bulgaria)	13 (Bulgaria)
Max.	85 (Ireland)	74 (Slovenia)	81 (Finland)	83 (Finland)

Source: own work based on: http://appsso.eurostat.ec.europa.eu/nui/setupModifyTableLayout.do.

In the recent years under analysis, despite the increase in the percentage of enterprises being engaged in the in-house R&D activities, our country's drop in the ranking down to the penultimate position among 24 European Union Member States was recorded. In the years 2002–2010, the countries characterized by the index level being similar to that of Poland included Romania, Lithuania, Spain, Cyprus, Estonia and Latvia. The outcomes in this field, being unfavourable to Poland, indicate the need to take measures to intensify research and development activities being carried out by enterprises. They should be focused on the development of infrastructure, increasing the expenditure on R&D, and stimulating private investments. Greater attention should also be paid to the links between the scientific and business circles, and particularly to the improvement of transfer of both knowledge and research results between research institutions and the industry [6, p.18; 7, p.28].

Another factor contributing to an increase in innovation of enterprises is their establishment of co-operation with other entities (Tab. 2). Co-operation provides broader access to knowledge and new technologies, promotes the exchange of experience, and allows decreasing costs and reducing risks of the innovation activities being carried out. In the period under analysis, an adverse phenomenon was recorded, namely the reduction in the percentage of industrial enterprises establishing co-operation (from 44% in the years 2002–2004 to 34% in the years 2008–2010). This resulted in a significant drop in the ranking from the relatively good (6^{th}) position in the beginning of the period under research; in the years 2008–2010, industrial enterprises were low in the ranking (16^{th} position among 25 EU countries). In the years 2002–2010, the countries characterized by the index level being similar to that of Poland included the Netherlands, Denmark, Sweden, Hungary, Austria, Slovakia and France. Particularly unfavourable was the lack of co-operation between enterprises and the R&D circles. There are many causes of this situation. It is most often reported that this results from the scientific circles being focused on basic research with a lower level of interest in the applied research and development work [8, p.223]. The weaknesses of the determinants of innovation activities also include the lack of relevant regulations to facilitate co-operation between companies and higher education institutions [9, p.83]. In addition, the entities whose task is to assist in the flow of technology are characterized by a relatively low level of development, and those which operate are much more often focused on incubation activities than on maintaining contacts between the scientific and economic circles[*].

Tab. 2. Percentage of enterprises which co-operated in innovation in the total number of innovation-active enterprises (%)

Specification	Years			
	2002-2004	2004-2006	2006-2008	2008-2010
Poland	44	46	39	34
Countries with values similar to those of Poland	The Netherlands Denmark	The Netherlands Sweden	Hungary Austria	Slovakia France
Poland's position in the EU	6	4	12	16
Min.	11 (Italy)	11 (Italy)	13 (Romania)	11 (Italy)
Max.	51 (Slovenia)	68 (Cyprus)	56 (Denmark)	57 (Cyprus)

The innovation activities being carried out by enterprises may also be contributed to by involving public resources, and an appropriate innovation policy. This is because innovation is a certain

[*] http://www.poig.gov.pl/Dokumenty/Lists/Dokumenty%20programowe/Attachments/116/Program_Innowacyjna_Gospodarka_zatwierdzony_przez_KE_22122011.pdf.

characteristic of the system, which consists in a propensity to support activities in both the short and long term, while innovation at macro level is defined as a new approach to the development of a country, which results in the emergence of new values [10, p.657]. In Poland, the percentage of enterprises which, in the years 2002–2010, received public support, ranged from 16% to 27%. As a consequence, Polish entrepreneurs were at 8–17th position in the ranking among the Community Member States. M. Bukowski, A. Szpor and A. Śniegocki [2, p.25–27] present the following causes of such a situation: one of them is the lack of activity in obtaining public support by the entrepreneurs themselves; another one is the low level of national expenditure on R&D, resulting from the fact that the main source of support for innovation activities is the funds being obtained from the EU. The authors also indicate that in Poland, three instrumental difficulties related to support for innovation are found, including: the lack of harmony between the type of an instrument and a problem; a conservative approach while evaluating applications; and the structure of funds not being adjusted to the needs of an enterprise.

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Summary

The analyses as carried out indicate that in the years 2002–2010, the level of innovation of industrial enterprises in Poland, as compared to other European Union countries, was relatively low. This particularly refers to the areas associated with R&D activities (a small percentage of enterprises being engaged in R&D activities, and a low level of expenditure being incurred by enterprises in that area), as well as a small percentage of innovative enterprises. Only as regards the percentage of enterprises which co-operate in the field of innovation, and benefit from public support, industrial enterprises in Poland came out relatively better, ranking in the top, or in the middle, of the list including other EU countries. The causes of this situation mainly result from financial barriers, insufficient involvement of public authorities in supporting the innovation activities, and the lack of co-operation between the R&D circles and enterprises.

Keywords: innovation, industrial enterprises, the European Union Countries.

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